

Figure 1

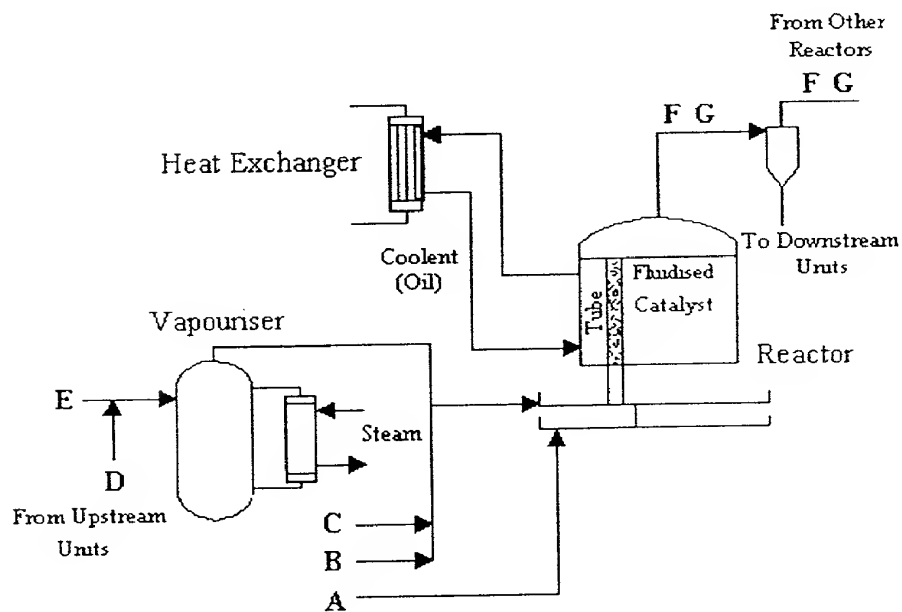


Figure 2

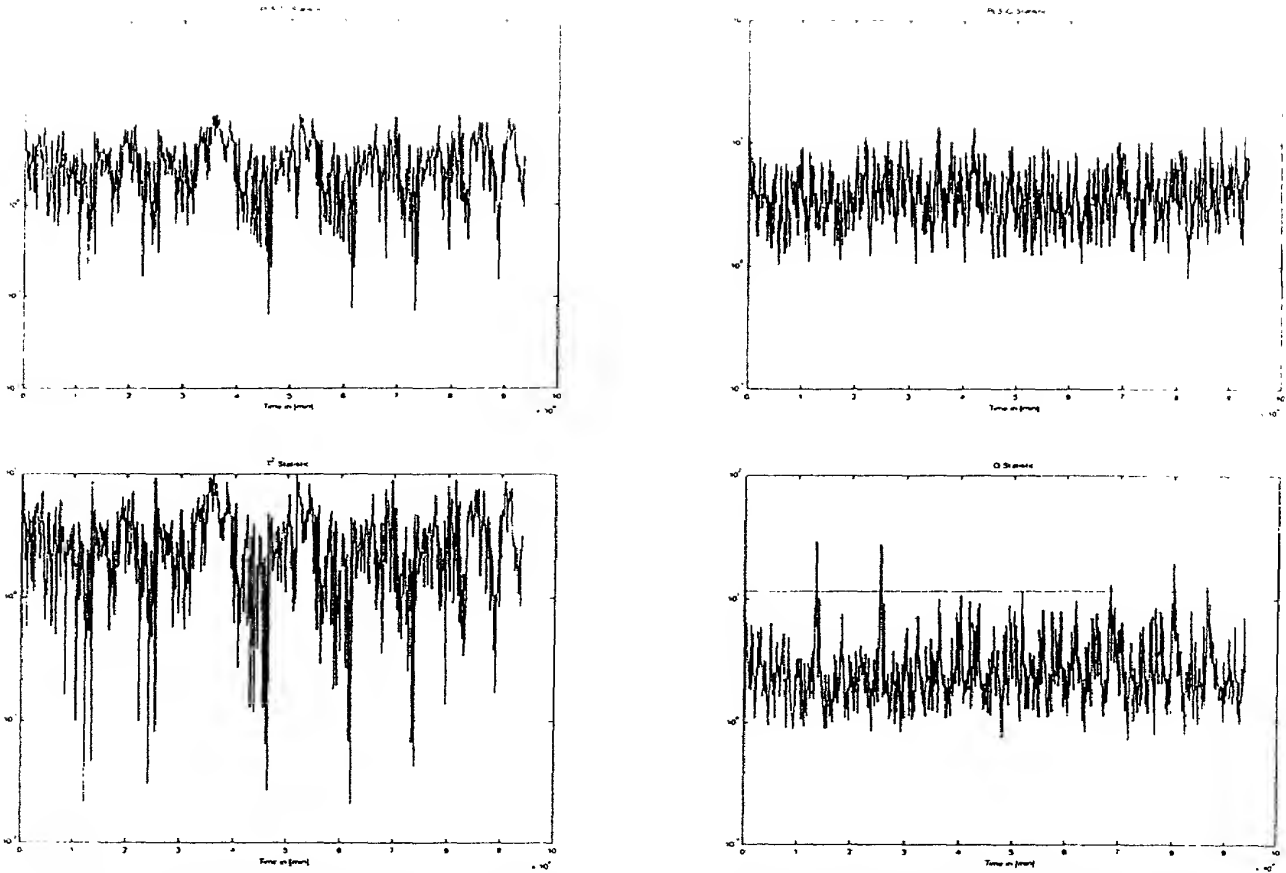


Figure 3: Statistics Monitoring Charts for Normal Operating Data (Upper Charts represent the PLS Monitoring Charts –PLS- T^2 and -Q statistic– and Lower Charts show the EPLS Monitoring Charts –EPLS- T^2 and -Q statistics–)

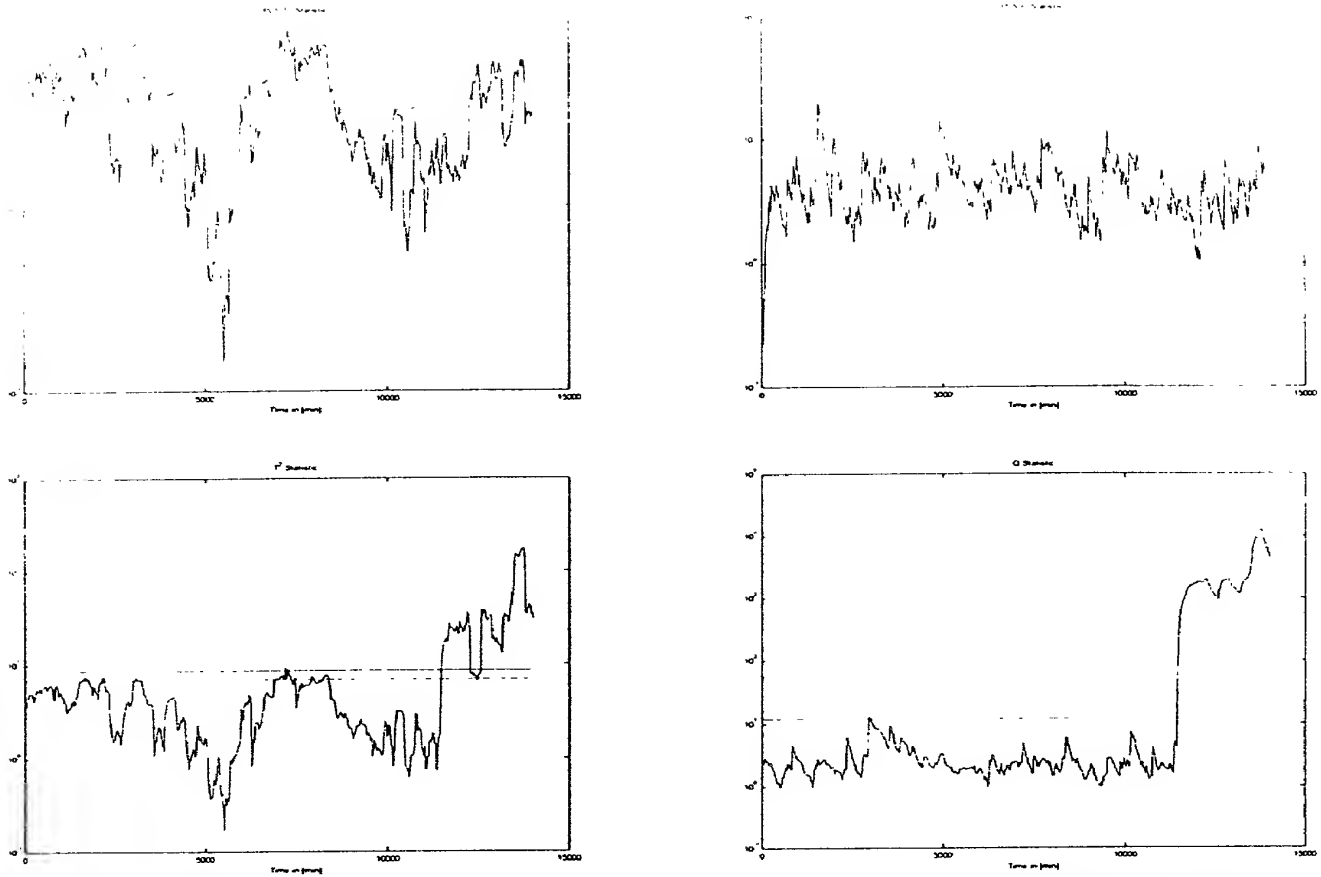


Figure 4: Statistical Monitoring Charts for the Unmeasured Disturbance (Upper Charts represent the PLS Monitoring Charts –PLS- T^2 and -Q statistic– and Lower Charts show the EPLS Monitoring Charts –EPLS- T^2 and -Q statistic)

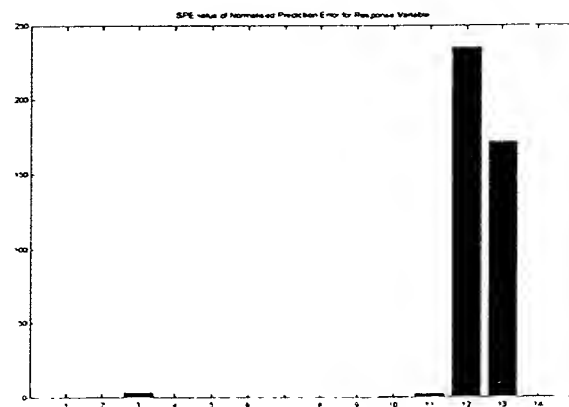


Figure 5: Error Contribution Chart for Time Instance 11460min The O_2 and CO Concentration in the Stack Gas Flow have the largest Prediction Error

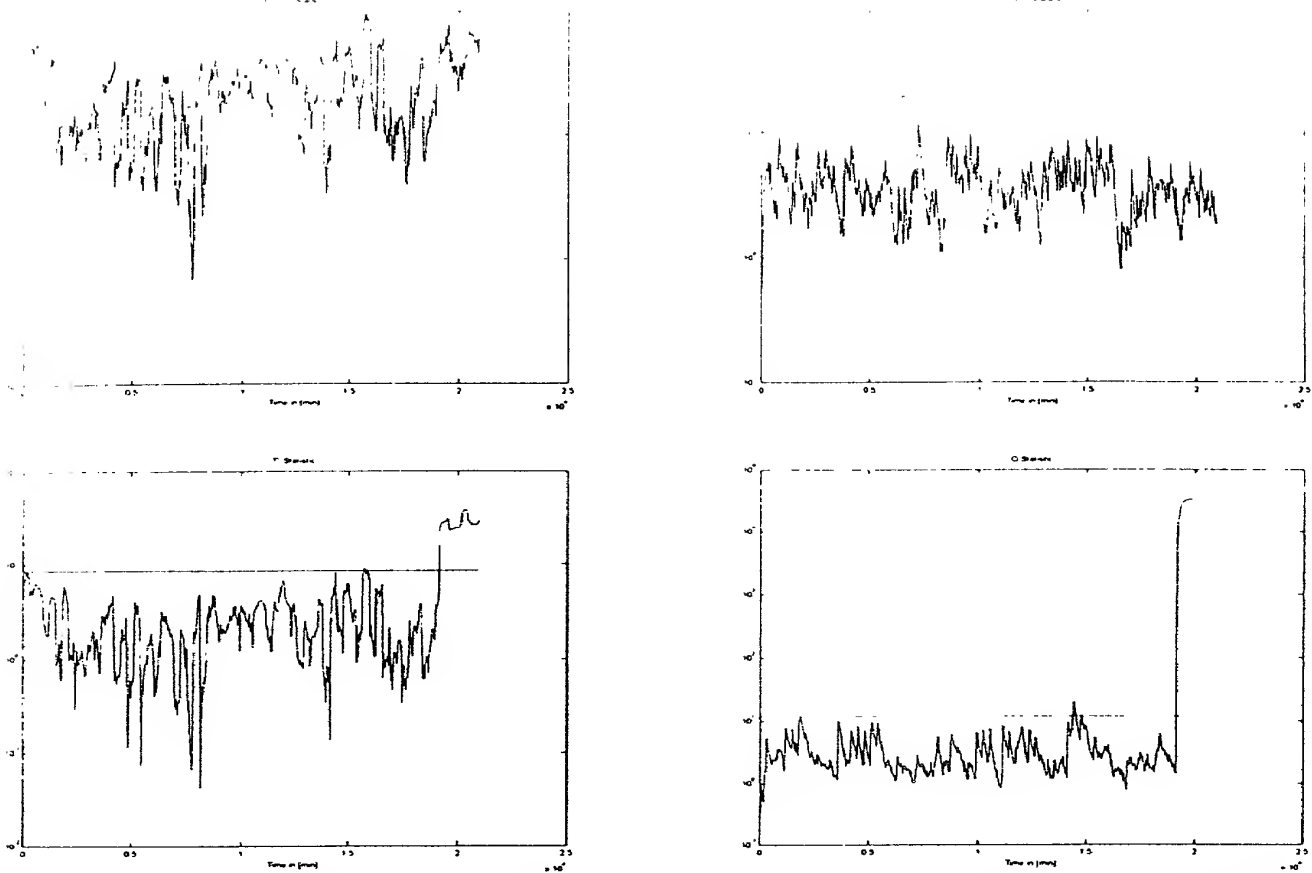


Figure 6: Statistical Monitoring Charts for the Change in the Regenerated Catalyst Flow into Reactor (Upper Charts represent the PLS Monitoring-Charts –PLS- T^2 and -Q statistics– and Lower Charts show the EPLS Monitoring Charts –EPLS- T^2 and -Q statistic–)

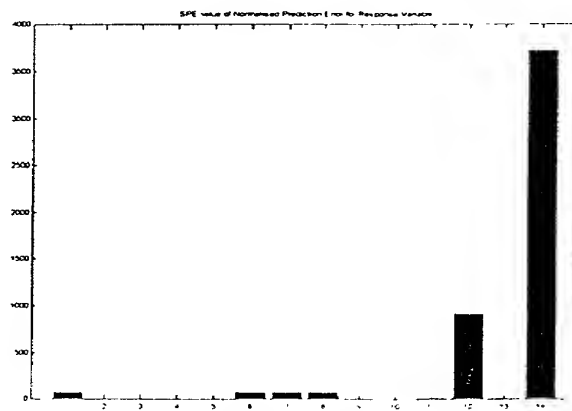


Figure 7: Error Contribution Chart for the Change of the regenerated Catalyst Flow to Reactor at Time Instance 19357min. The Standpipe Catalyst Level and O_2 Concentration in Stack Gas are mostly affected

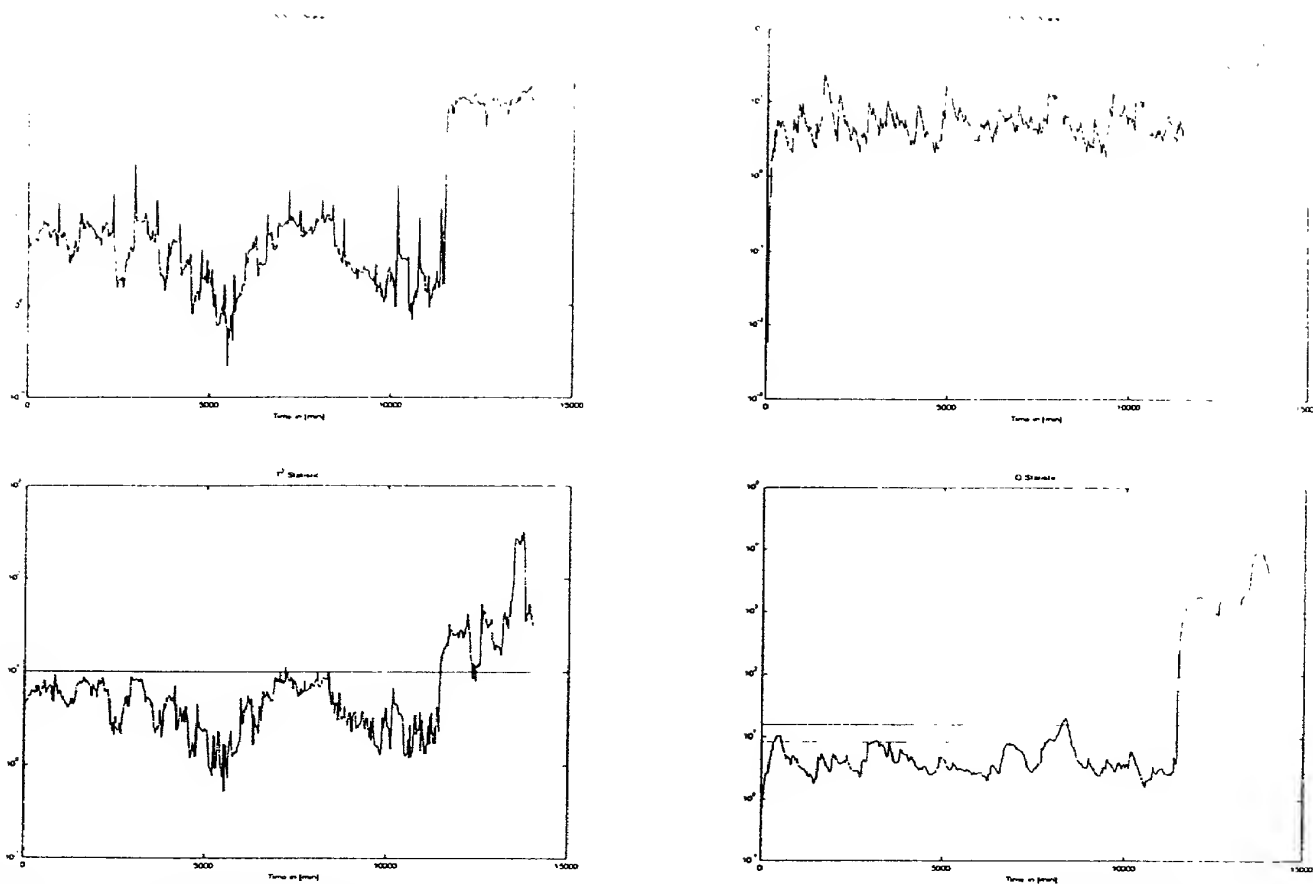


Figure 8: Statistical Monitoring-Charts for Unmeasured Disturbance (Coking Factor); Predictor Variables include the Wet Gas Compressor Suction Valve (Upper Charts represent the PLS Monitoring Charts –PLS- T^2 and -Q statistic– and Lower Charts show the EPLS Monitoring Charts –EPLS- T^2 and -Q statistic–)

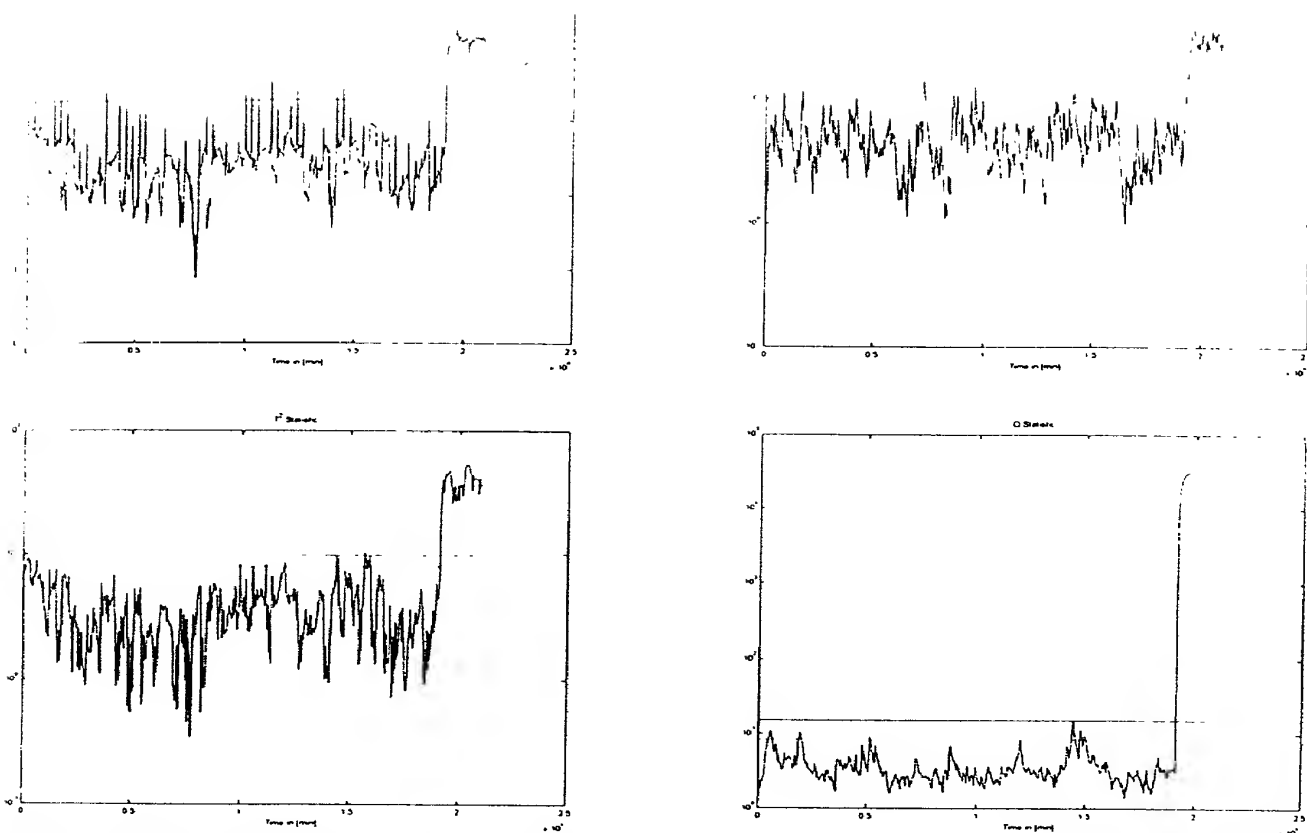


Figure 9: Statistical Monitoring-Charts for the Change of the regenerated Catalyst Flow to the Reactor; Predictor Variables include the Wet Gas Compressor Suction Valve (Upper Charts represent the PLS Monitoring Charts –PLS- T^2 and -Q statistic– and Lower Charts show the EPLS Monitoring Charts –EPLS- T^2 and -Q statistic–)

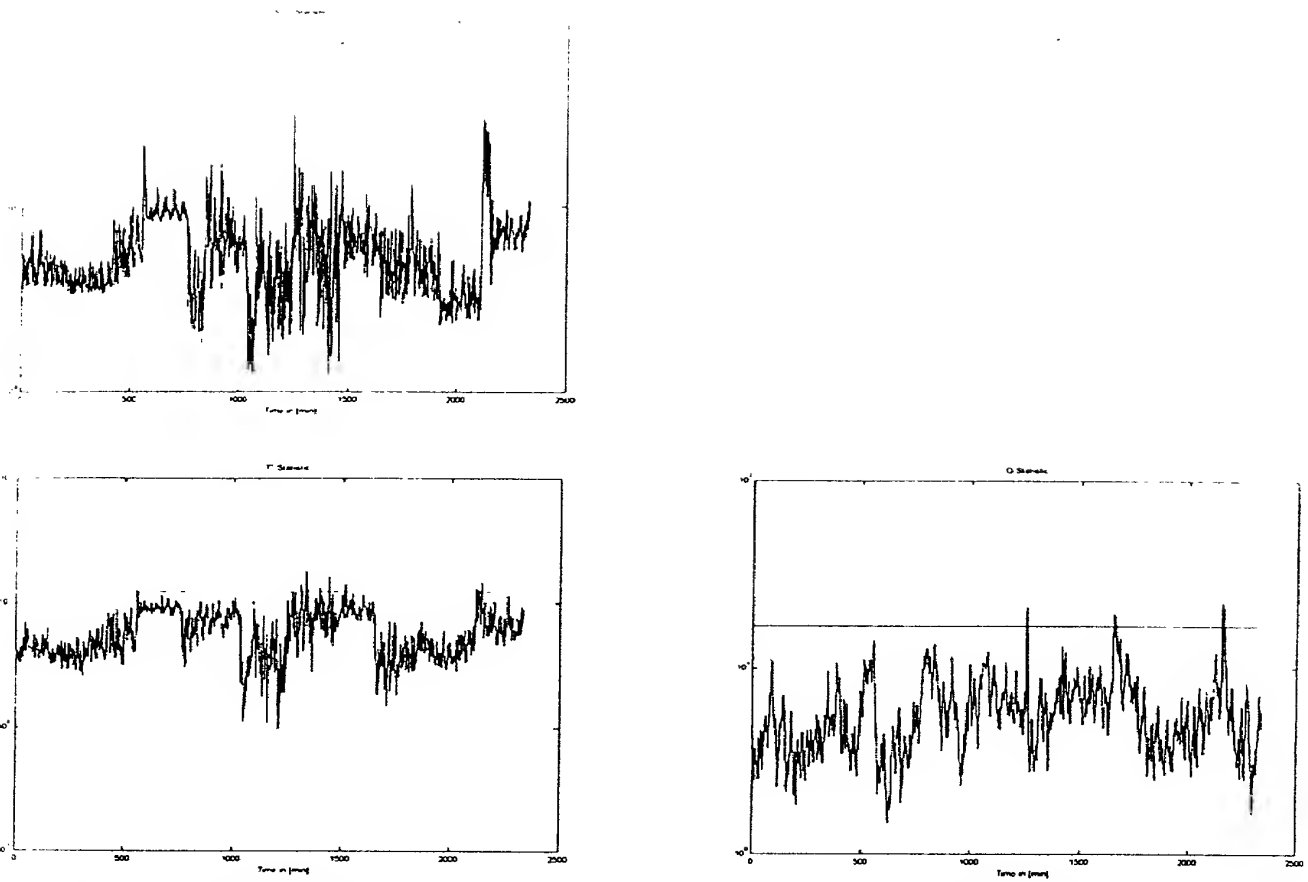


Figure 10: Statistics Monitoring Charts for Normal Operating Data (Upper Chart represent the PLS Monitoring Chart –PLS- T^2 and -Q statistic– and Lower Charts show the EPLS Monitoring Charts –EPLS- T^2 and -Q statistic–)

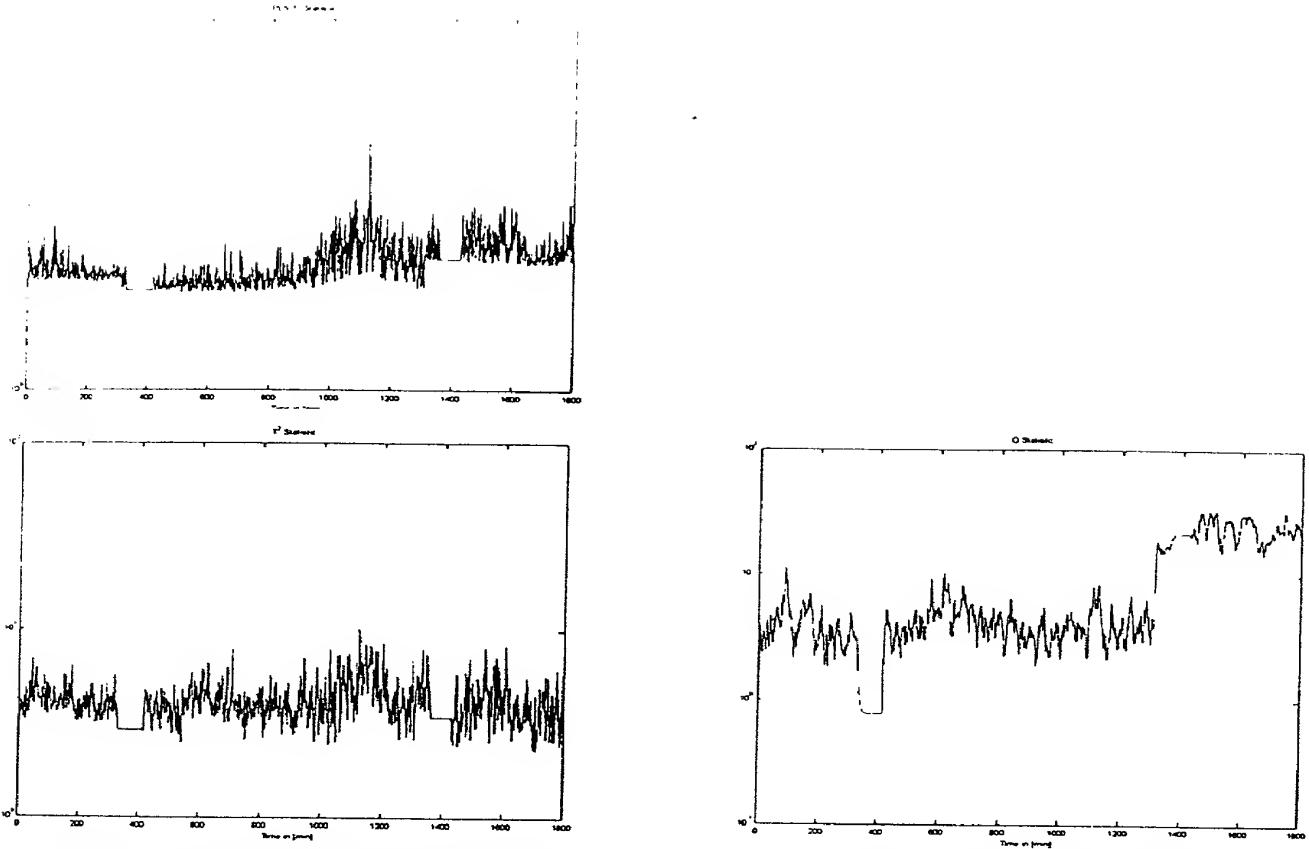


Figure 11: Statistical Monitoring Charts for the Unmeasured Disturbance; (Upper Chart represent the PLS Monitoring Chart –PLS- T^2 and -Q statistic–, Lower Charts show the EPLS Monitoring Charts –EPLS- T^2 and -Q statistic–)

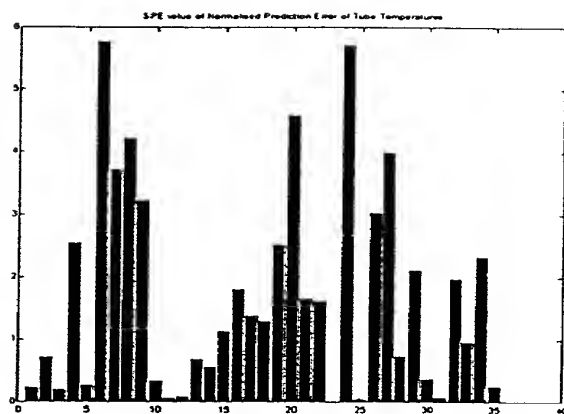
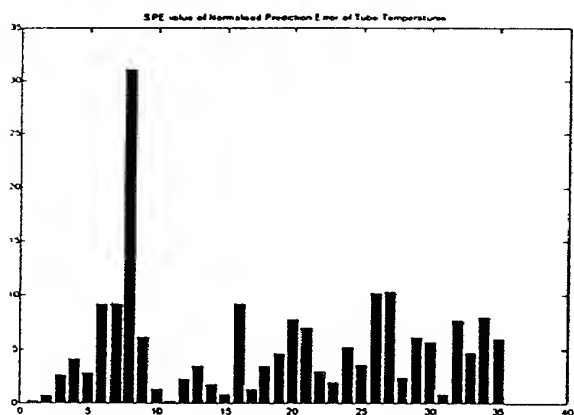
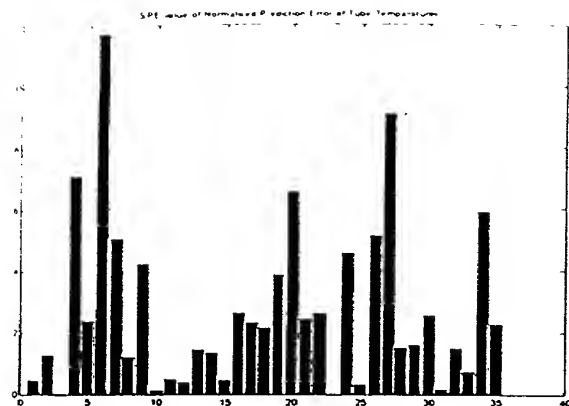


Figure 12: EC-Charts for Steam Pressure Upset at Time Instances 1500min (upper left plot), 1501min (lower Left plot) and 1502min (upper right plot)

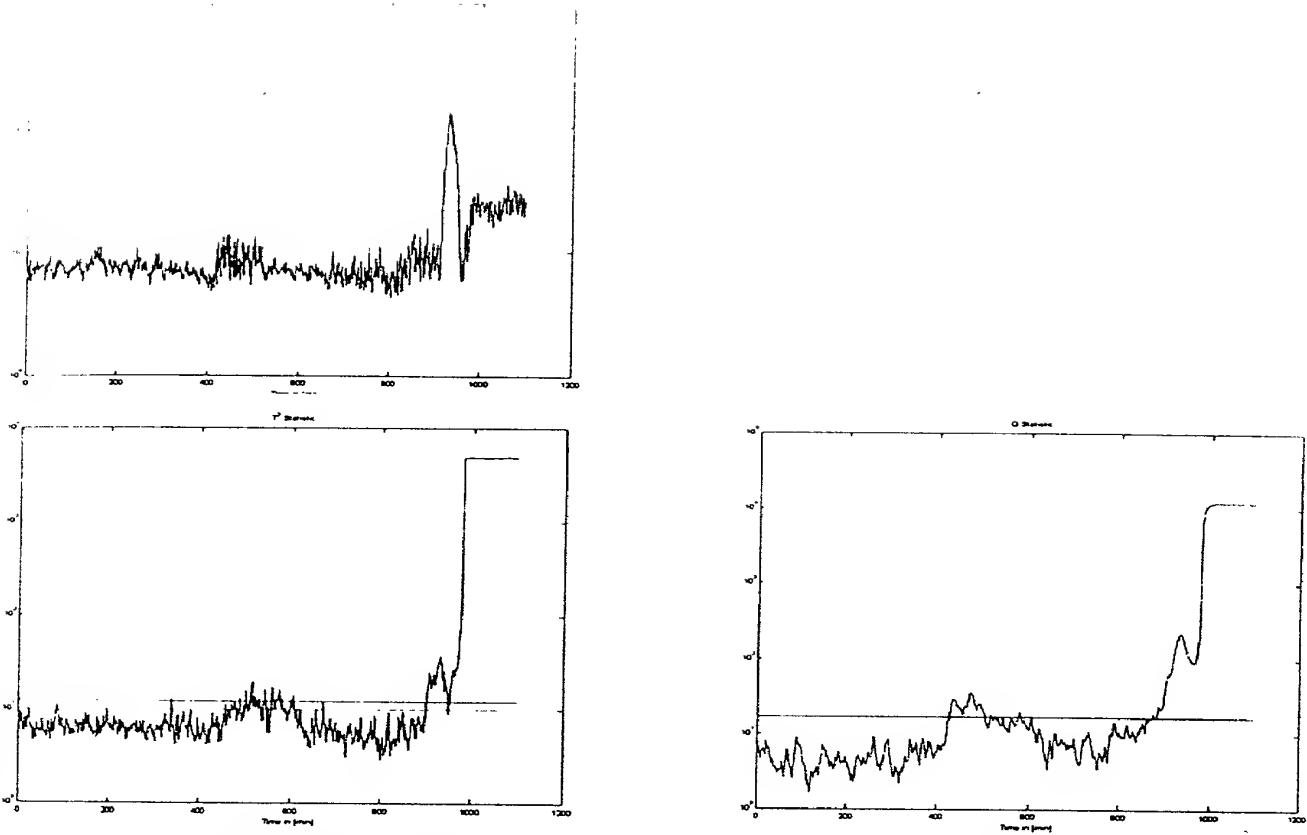


Figure 13: Statistical Monitoring Charts for an abnormal behaviour of one of the tubes.
 (Upper Chart represent the PLS Monitoring Chart –PLS- T^2 and -Q statistic–
 Lower Charts show the EPLS Monitoring Charts –EPLS- T^2 and -Q statistic–)

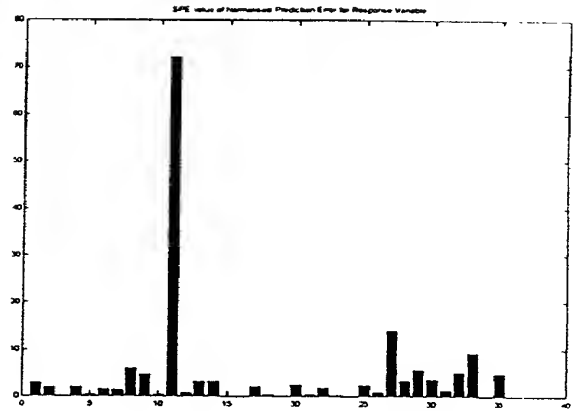
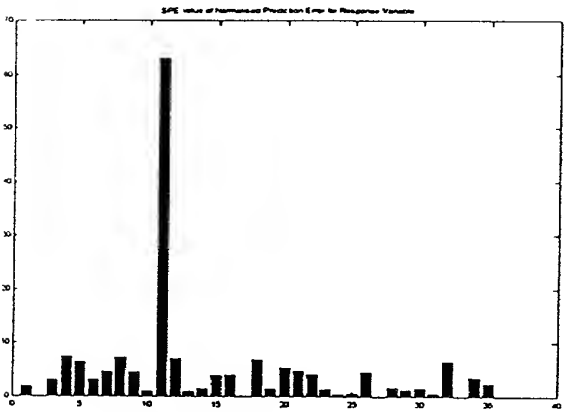
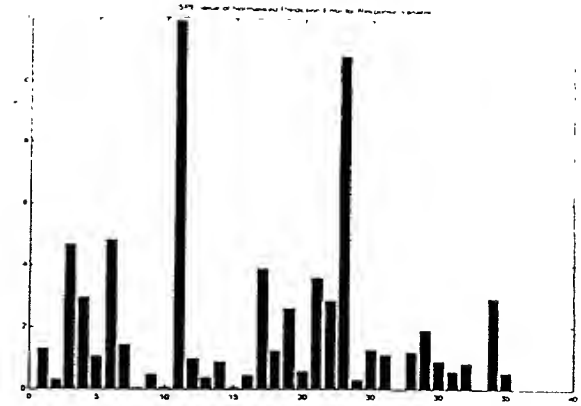
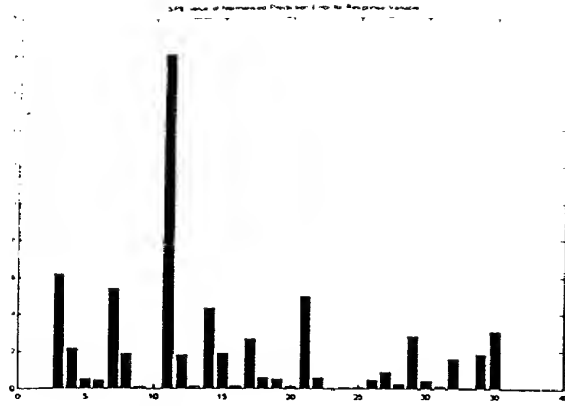


Figure 14: EC-Charts for Fluidisation Problem in one of the Tubes at Time Instances 436min (upper left chart), 888min (upper right chart), 905min (lower left) and 910min (lower right chart)